STRATEGIC CLIMATE ADAPTATION PLAN FOR HAMILTON'S URBAN FOREST

A Ward-Level Resilience Framework for 2030, 2050, and 2080

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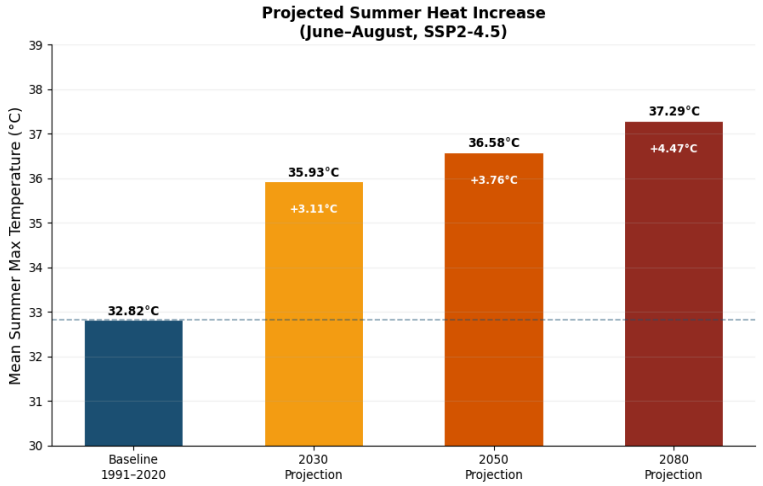
The City Problem and Background

275,156	15	98.4%	32.82°C	+4.47°C
City-owned trees	Wards analyzed	Species-matched	Baseline temp	Projected increase by 2080

- 275,156 trees inventory, 15 wards analyzed
- Extreme Heat & Flooding identified as Priority Risks
- Norway Maple (Invasive Species) Dominance
- Summer Heat +4.47◦C Projected Increase by 2080



How vulnerable is Hamilton's current urban forest to future climate change?

Does current species composition provide sufficient resilience to future climate conditions?

Which wards and dominant species exhibit the highest climate vulnerability?

Urban Forests are KEY Climate Assets ***BUT increasingly Vulnerable to Climate Stress***

DATA SOURCES: City of Hamilton Open Data Portal · GBIF Backbone Taxonomy · Metro Vancouver Urban Forest Climate Adaptation Species Selection Database · CanDCS-M6 / Canadian Centre for Climate Services · Ontario Climate Station Records

Methodology: Vulnerability Scoring & Biodiversity Rule

IPCC AR5 Framework Implementation

Exposure

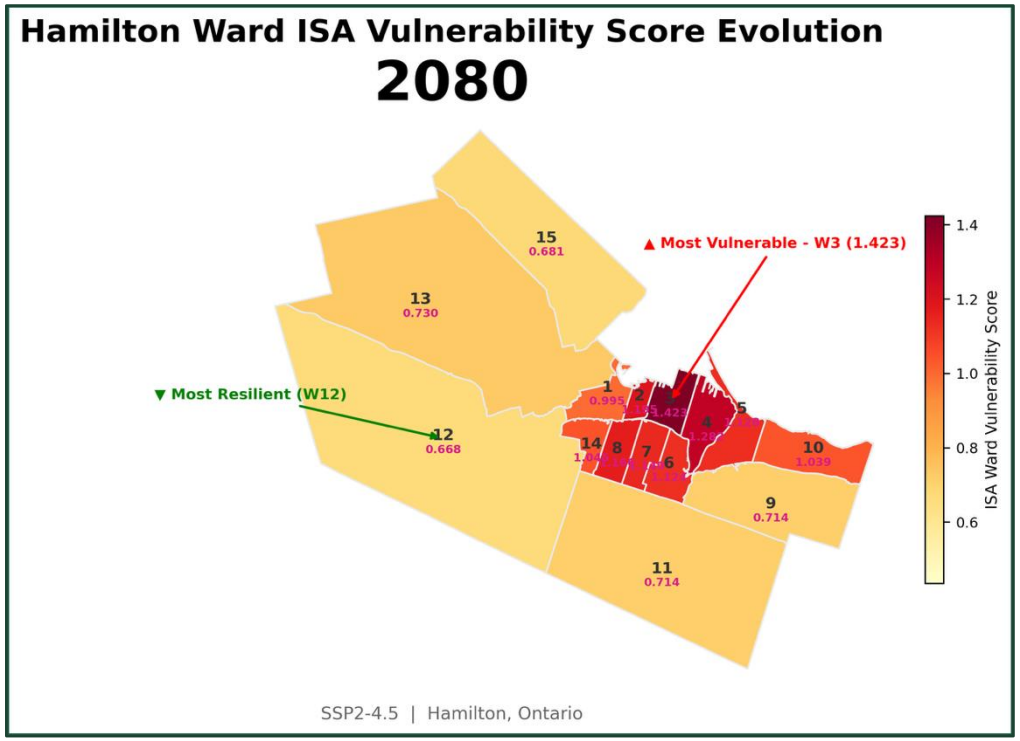
Climate stress magnitude: Extreme Heat Intensity (ΔTXx) and Land-Use Heat Index.

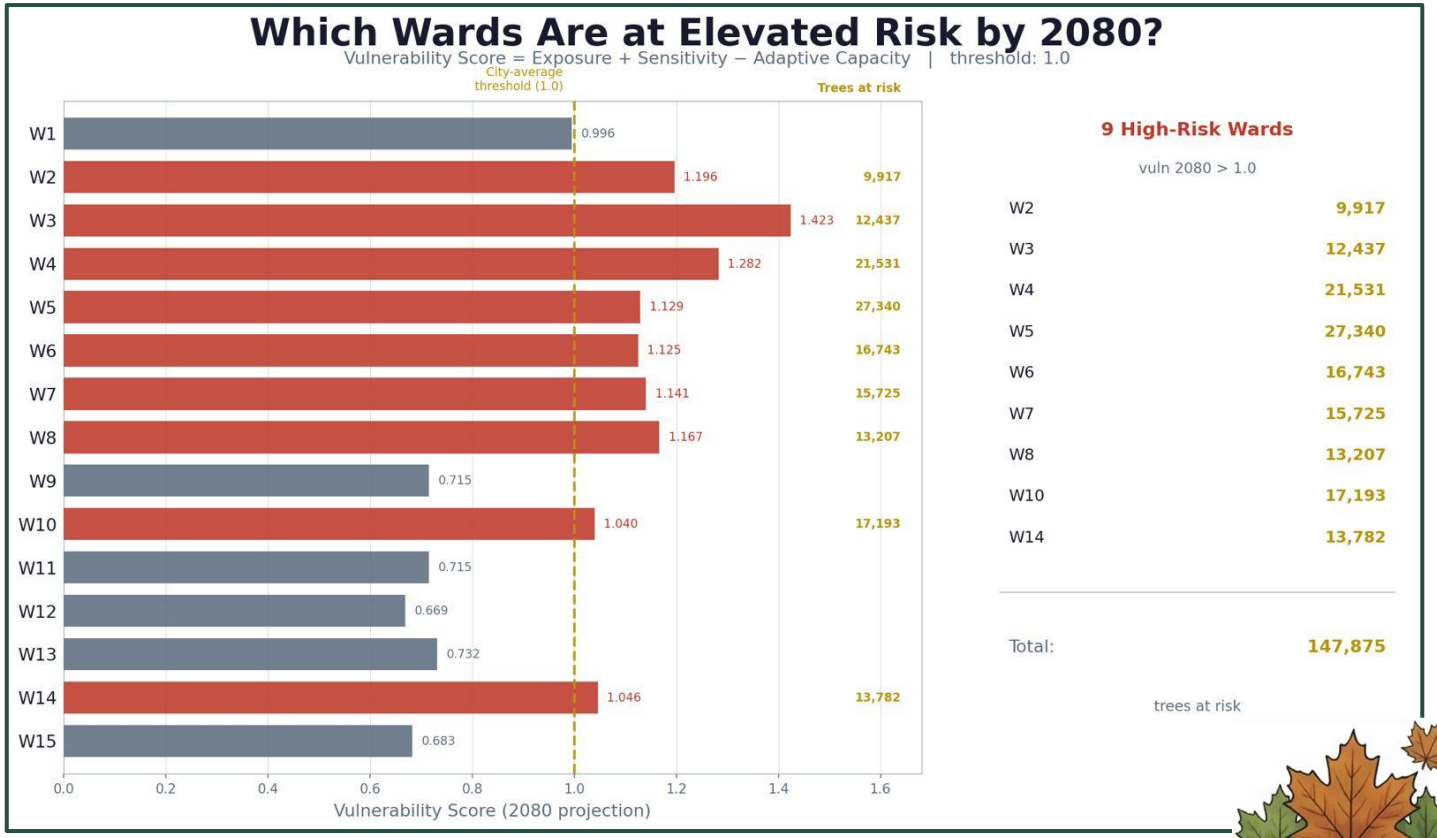
Sensitivity

Species susceptibility to stress, calculated as (1 – Resilience Score).

Adaptive Capacity

Recovery potential: DBH, heat/drought tolerance, pollution, and climate suitability.



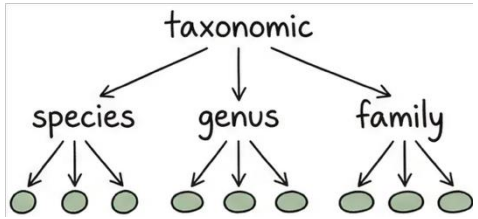


Wards 3, 4, and 7 were identified as Most Vulnerable Wards with the highest climate vulnerability scores by 2080.

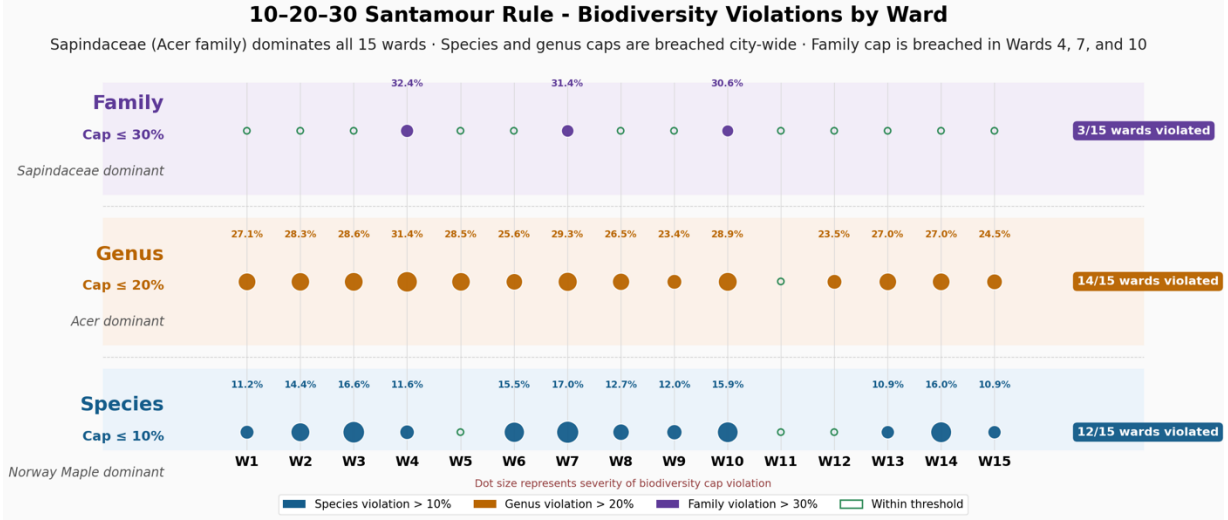
Key Findings

KEY FINDINGS AT A GLANCE

0.966 Ward 3 replanting priority — highest in city	**98.4%** Trees matched with resilience traits	**11,221** Ash trees at imminent EAB risk (4.1%)	**0.938** Common Hackberry — top resilience score	**9 of 10** Recommended species introduce new genera	**Ward 7** Highest Norway Maple share (17.0%)	**Ward 4** Highest Acer genus share (31.4%)	**Wards 9,11,12,13,15** Lowest vulnerability & built stress



- No single species >10%
- No genus >20%
- No family >30%



Biodiversity Risk: Norway Maple exceeds 10% species threshold • Acer genus exceeds 20% in 14 of 15 wards • Ward 4: 31% Acer dominance • Sapindaceae family approaching 30% limit

Norway Maple (Acer platanoides)

11.9% of Total urban forest

Exceeds 10% Santamour threshold

Major vulnerability contributor

Dominant urban species contributing significantly to overall forest vulnerability

Fraxinus Species (Ash Trees)

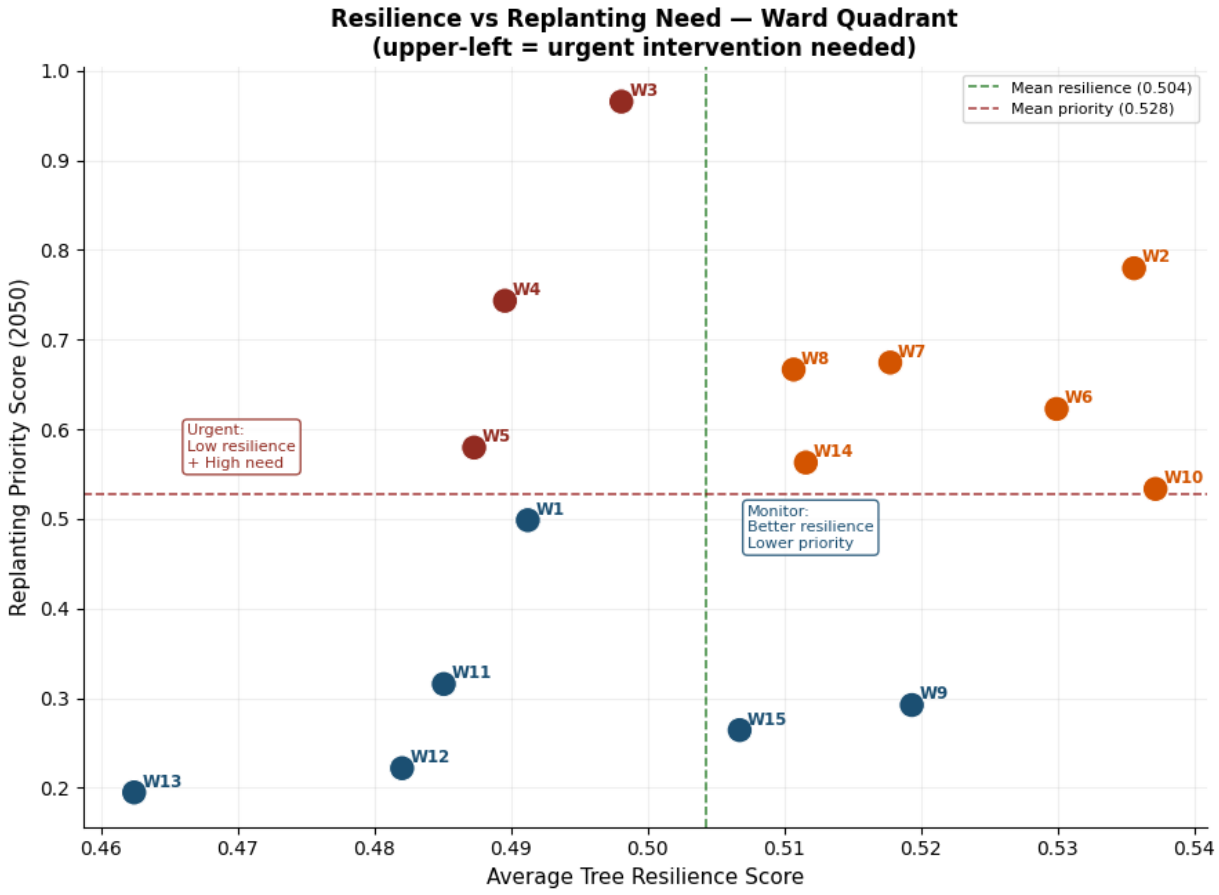
9,170 trees (3.3% of inventory)

Highly vulnerable to Emerald Ash Borer

Excluded from recommendations

Extreme pest susceptibility eliminates future planting viability

Prioritization by Ward & Species



**Resilience Score (0-1 Scale) based on Adaptive Capacity Metrics.*

TOP RECOMMENDED SPECIES

Supports climate resilience and biodiversity goals

Common Hackberry
(Resilience Score: 0.938)
High Tolerance to Urban Stress – Long-term canopy coverage

Asian Pear
(Resilience Score: 0.917)
Produce edible fruit - Contribute to urban food resilience

London Plane Tree
(Resilience Score: 0.833)
Exceptional Pollution Tolerance – Improve air quality

Tanoak
(Resilience Score: 0.833)
Strong Habitat Value – Support urban biodiversity & ecological network connectivity

Eastern Red Cedar
(Resilience Score: 0.813)
Evergreen Structure – Provide year-round carbon sequestration & wind buffering

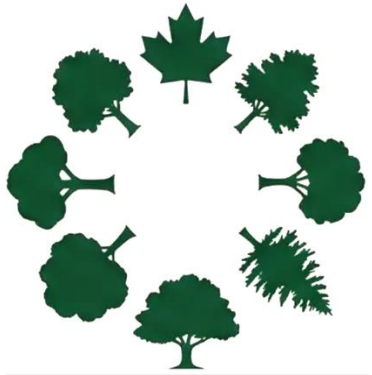
Gingko
(Resilience Score: 0.813)
Extremely resilient to pests & climate stress – Ensure low-maintenance, long lifespan

PLANT THE RIGHT TREES IN THE RIGHT WARD BEFORE IT'S TOO LATE!

Conclusion and Recommendations

Prioritize Ward 3

Critical climate hotspot requires immediate attention - lowest resilience combined with highest replanting priority score



Diversify Species Portfolio

Implement Santamour 10/20/30 rule to reduce maple dependency and enhance ecosystem resilience

Align Policy Framework

Integrate resilience scoring into City of Hamilton Urban Forest Strategy 2020 implementation

THE BIGGEST RISK TO URBAN FOREST IS NOT CLIMATE ALONE!

Strategic Coordinated Action Across Vulnerable Wards, Species Diversification, and Policy Integration is Required!

Scan me if you’re curious!